Challenges of Caudal Epidural Steroid Injection in Spinal Epidural Lipomatosis

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INTRODUCTION

- Spinal epidural lipomatosis (SEL) is an uncommon condition characterized by excessive epidural fat that can contribute to spinal canal stenosis and neural compression.
- While obesity and systemic corticosteroid exposure are established risk factors, the role of epidural steroid injections in SEL remains unclear.
- We describe a patient with known SEL undergoing serial caudal epidural injections, with particular attention to changes in fluoroscopic contrast spread and the technical challenges encountered during treatment.

MATERIALS & METHODS

- We reviewed the patient's clinical course, lumbar MRI findings, and fluoroscopic epidurograms from repeated caudal epidural steroid injections.
- Procedural images were compared over time to assess changes in epidural contrast spread in the setting of spinal epidural lipomatosis.
- Relevant MRI findings were reviewed for the extent and distribution of epidural fat and associated narrowing of the thecal sac.
- The patient provided informed consent for presentation of the case and use of de-identified clinical and imaging data.
- IRB and IND approval were not required for this case report.

CASE REPORT

- A patient with chronic low back pain and lumbar radicular symptoms underwent multiple caudal epidural steroid injections over several years.
- Earlier procedures demonstrated relatively unrestricted cephalad epidural contrast spread.
- With subsequent injections, fluoroscopic epidurograms showed increasingly limited and irregular cephalad distribution of contrast despite appropriate needle placement and no evidence of intravascular uptake.
- Lumbar MRI demonstrated prominent epidural fat consistent with spinal epidural lipomatosis, with narrowing of the thecal sac and available epidural space.
- The patient tolerated the procedures without immediate complications.

SERIAL CAUDAL EPIDUROGRAMS

09/13/2024

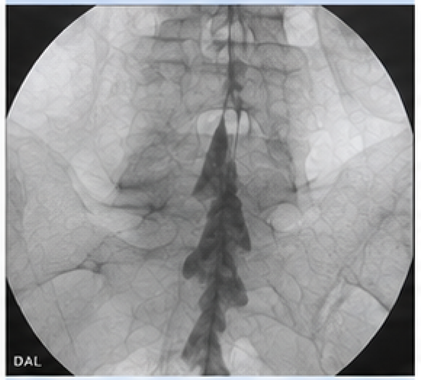


Figure 1. Caudal epidurogram (09/13/2024) demonstrating relatively unrestricted cephalad contrast spread.

06/27/2025

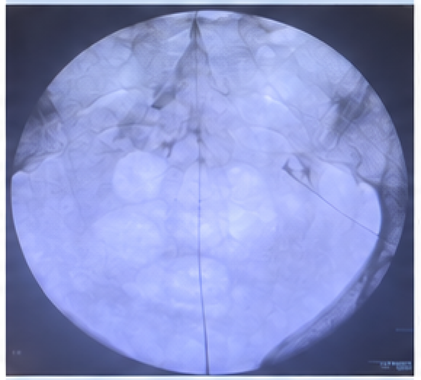


Figure 2. Caudal epidurogram (06/27/2025) demonstrating more limited and irregular cephalad contrast spread.

06/12/2026

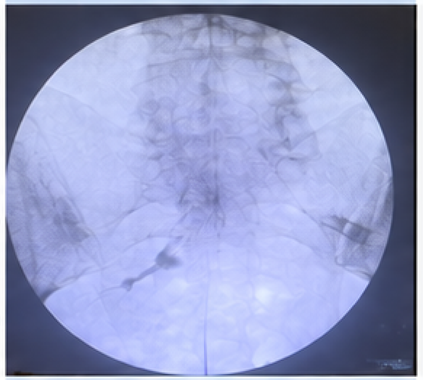


Figure 3. Caudal epidurogram (06/12/2026) demonstrating markedly restricted cephalad contrast spread.

LUMBAR MRI FINDINGS

2016

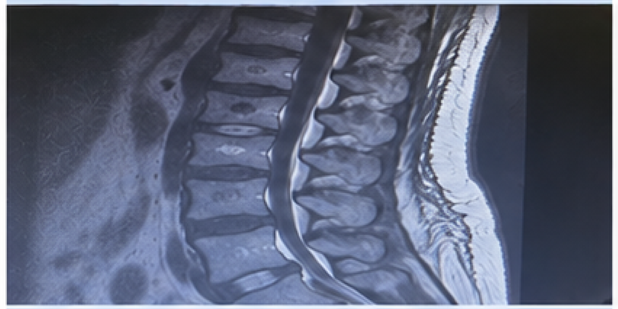


Figure 4. Lumbar MRI (2016) demonstrating epidural fat consistent with spinal epidural lipomatosis.

2026

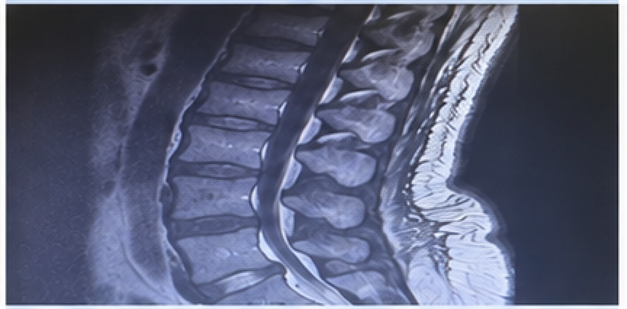


Figure 5. Lumbar MRI (2026) demonstrating prominent epidural fat with narrowing of the thecal sac and available epidural space.

RESULTS

- Earlier caudal epidural injections showed relatively unrestricted cephalad epidural contrast spread.
- With subsequent injections, fluoroscopic epidurograms demonstrated increasingly limited and irregular cephalad distribution of contrast despite appropriate needle placement and no evidence of intravascular uptake.
- Lumbar MRI demonstrated prominent epidural fat consistent with spinal epidural lipomatosis, with narrowing of the thecal sac and available epidural space.
- During the most recent caudal injection, contrast spread was markedly restricted compared with prior procedures, requiring careful assessment before medication administration.
- Review of the serial procedural images demonstrated a change in the pattern and extent of epidural contrast distribution over time.
- The patient tolerated the procedures without immediate complications.

DISCUSSION

- Spinal epidural lipomatosis can make epidural steroid injections technically challenging by reducing the available epidural space.
- In our patient, contrast spread became more restricted over time, corresponding with the presence of epidural lipomatosis on MRI.
- This case highlights the importance of reviewing prior imaging and recognizing changes in contrast spread during repeat procedures, particularly when needle position appears appropriate.

CLINICAL IMPLICATIONS / KEY TAKEAWAYS

- Spinal epidural lipomatosis may reduce the available epidural space and alter the expected pattern of contrast spread.
- Serial epidurograms demonstrated increasingly restricted cephalad contrast distribution despite appropriate needle placement.
- Prior imaging and changes in contrast spread should be carefully reviewed during repeat epidural procedures.

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